California Energy Commission

DISTRIBUTED ENERGY RESOURCES: THE PIER PROGRAM ACTIVITIES

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Public Interest Energy Research (PIER) Program

Overview

- PIER Program Background
- DER Objectives
- Existing DER Projects
- Major Continuing DER Issues
- DOE Collaborative Opportunities

PIER Program

Background

- Established by California AB 1890 and SB 90 in 1996-97 and implemented in 1998.
- $62.5 million collected annually from investor-owned electricity utility ratepayers for “public interest” energy research, development and demonstration (RD&D) projects.

PIER Program

Technical Subject Areas

- Environmentally Preferred Advanced Generation (EPAG)
- Energy Systems Integration
- Renewable Energy
- Industrial/Agricultural/Water Efficiency
- Building Efficiency
- Energy-Related Environmental

DER Objectives

- DER that is clean, efficient, and cost effective
- Safe, reliable, & effective integration of DER into the distribution system
- Optimize DER to provide maximum system-wide benefits (reliability, power quality, security, etc.)
- Initially a niche market with large growth potential.

PIER DER Projects

PROJECT TYPE	NO. of PROJECTS	PIER FUNDING (millions)
Generation	34	$28.3
System Effects	10	$6.5
Market Integration	10	$5.0
TOTAL	54	$39.8

Major Continuing DER Issues

- Generation
  - DER technologies need to demonstrate sufficient overall efficiency, reliability, emissions, etc., to have widespread acceptance
  - DER should be optimized for primary benefits (CHP, power quality, security, etc.) and be siteable
  - Renewable DER technologies need to become more affordable

Major Continuing DER Issues

- System Effects
  - DER must have acceptable net air quality effects, given other benefits
  - Need data clarifying DER benefits
  - Must determine if high penetration of DER will have adverse impacts or benefits on T&D system
  - Need to determine if microgrids can be used to optimize effects on T&D system

Major Continuing DER Issues

- Market Integration
  - Must implement national interconnection standards
  - Determine how DER can access robust markets and be exposed to price signals
  - Additional DER benefits need to be captured and monetized (e.g. T&D reliability, environmental, CHP, etc.)
  - Need outreach to educate stakeholders and consumers

DOE Collaborative Opportunities

- Develop standardized nationwide protocols for testing and performance reporting of DER, including an unbiased database of project operation
- Determine overall net effects from widespread implementation of DER
- Determine level of DER that the system can absorb without adverse impacts (DUIT Project)

DOE Collaborative Opportunities

- Develop and demonstrate the microgrid concept to validate its potential benefits to the T&D system
- Develop standards for communication and control to enable DER access to markets and integration with the T&D system
- Implement a national outreach program to educate people on DER issues and technology